

CLAIMS

1. A stimuli-responsive polymer hydrogel capable of gelating as a result of absorbing and swelling with water and capable
5 of changing its degree of swelling and/or volume in response to a stimulus, wherein the polymer hydrogel comprises a water-insoluble polymer as a phase separation structure.
2. The stimuli-responsive polymer hydrogel according to Claim
10 1, wherein the water-insoluble polymer is a polymer comprising no cross-linking point.
3. The stimuli-responsive polymer hydrogel according to Claim
15 1, wherein the water-insoluble polymer has a glass transition temperature lower than the working temperature of the stimuli-responsive polymer hydrogel, and wherein the water-insoluble polymer stands a rubbery state at the working temperature.
- 20 4. The stimuli-responsive polymer hydrogel according to Claim 1, wherein the stimulus is a change in pH, and wherein the stimuli-responsive polymer hydrogel changes its degree of swelling and/or volume in response to the pH change.
- 25 5. A method for producing a stimuli-responsive polymer

hydrogel, comprising the steps of:

carrying out the polymerization of a monomer having a stimuli-responsive functional group with a crosslinker in a solution of a water-insoluble polymer in an organic solvent
5 to yield an organogel comprising the water-insoluble polymer and a stimuli-responsive polymer;

subjecting the organogel to one treatment selected from drying under reduced pressure, drying by heating, and drying by heating under reduced pressure to remove the organic solvent
10 to thereby yield a dried gel; and

allowing the dried gel to swell with water to thereby yield a hydrogel.

6. A method for producing a stimuli-responsive hydrogel,
15 comprising the steps of carrying out the polymerization of a monomer having a stimuli-responsive functional group with a crosslinker in a solution of a water-insoluble polymer in an organic solvent to yield an organogel comprising the water-insoluble polymer and a stimuli-responsive polymer; and
20 immersing the organogel in water or a water-containing liquid mixture to thereby yield a hydrogel.

7. A polymer actuator comprising a stimuli-responsive polymer hydrogel capable of gelating as a result of absorbing and swelling
25 with water and capable of changing its degree of swelling and/or

volume in response to a stimulus, the stimuli-responsive polymer hydrogel comprising a water-insoluble polymer as a phase separation structure.